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| EXAMINER |
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* SHIJIAN ZHOU, ANDREW T. HSU, YANHU GUO,  
LINDA J. LUDEK BROUNS, AND JOHN C. MORGANTE

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Appeal 2008-0077  
Application 10/047,878  
Technology Center 2800

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Decided: April 28, 2008

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Before KENNETH W. HAIRSTON, ROBERT E. NAPPI,  
and KEVIN F. TURNER, *Administrative Patent Judges*.

TURNER, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from the Examiner's rejection of claims 1-12 and 14-18. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

STATEMENT OF CASE

Appellants disclose an electric motor that uses centrifugal force to force liquid through the motor to achieve cooling. (Spec. [0001]). The motor includes a series of passageways to conduct a nongaseous liquid coolant through the motor. (Spec. [0005]).

Independent claim 1, which is deemed to be illustrative of the claimed invention, reads as follows:

1. An electric motor comprising:
  - a stator for producing a magnetic field;
  - a rotor rotated by said magnetic field;
  - a motor shaft coupled to said rotor;
  - a first set of passageways through said rotor to conduct a nongaseous liquid coolant
  - a passage in said motor shaft to conduct said nongaseous liquid coolant; and
  - wherein said nongaseous liquid coolant is conducted through said rotor and said motorshaft by centrifugal force generated by the rotation of said electric motor.

The Examiner relies on the following prior art references to show unpatentability:

|            |              |               |
|------------|--------------|---------------|
| Kano       | US 5,019,733 | May 28, 1991  |
| Jarczynski | US 5,189,325 | Feb. 23, 1993 |
| Grennan    | US 5,994,804 | Nov. 30, 1999 |
| Yamamoto   | JP 09-154258 | Jun. 10, 1997 |

The Examiner rejected, under 35 U.S.C. § 102(b):

claims 1, 2, and 6 as anticipated by Kano,

under 35 U.S.C. § 103(a):

claim 3 as unpatentable over Kano and Jarczynski,

claim 4 as unpatentable over Kano,

claims 5, 9-12, 14, 17, and 18 as unpatentable over Kano and Yamamoto,

claims 7 and 8 as unpatentable over Kano and Grennan, and

claims 15 and 16 as unpatentable over Yamamoto, Kano, and Grennan.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the Brief and the Answer for their respective details. Only those arguments actually made by Appellants have been considered in this decision. Arguments that Appellants did not make in the Brief have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

#### ISSUE

Have Appellants shown that the Examiner erred in establishing that the cited prior art references teach or suggest all of the disputed elements of claims 1-12 and 14-18?

#### FINDINGS OF FACT

1. The application details an electric motor having a stator producing a magnetic field and a rotor rotated by that magnetic field. A motor shaft is coupled to the rotor, where the rotor has a set of passageways to conduct nongaseous coolant. The motor also has a passage between the motor shaft and the rotor. The motor shaft has a conical shape so that a centrifugal force generated by the rotation of the motor conducts the nongaseous coolant

through the motor. (Spec. [0010]-[0012], [0014] and [0015]; Figs. 1 and 2, elements 10, 12, 14, 18, 20, 22, 24, 30, 32, 34, 36, and 38).

2. Kano discloses an AC generator having a stator and field coils which are cooled by a fluid passing through passageways within the rotating shaft of the rotor. The fluid is drawn into a hole in the end of the rotating shaft, transported axially through a passageway in the shaft, and then forced radially outward through channels in the rotating shaft into the areas surrounding the field and stator coils. Engine oil is disclosed as being used as a cooling fluid. (Abstract, col. 2, l. 61 – col. 4, l. 8; Figs. 2 and 4 elements 22, 62, 74, 96a, and 96b).

3. Kano discloses that the flow of air can be used to provide cooling to the engine by drawing air through the inlet ports in the housing and using centrifugal action to move the air past the field coil and out the outlet ports. Kano does not explicitly disclose the use of centrifugal force to impel the oil coolant through the motor, although the flows of the different coolants are similar. (Col. 6, ll. 31-64, Figs. 4 and 6, elements 96a, 96b, 114a, and 114b).

4. Jarczyński discloses the liquid cooling of a rotor of an electrical machine. The rotor may be formed through various processes as disclosed. (Abstract; col. 8, ll. 3-14).

5. Grennan discloses an air-cooled dynamoelectric machine. Air pumped into the manifold chambers can exit through axially directed ports after being directed through a series of radial passages. (Abstract; col. 4, ll. 45-55; Fig. 1, elements 20, 66, 68, and 70).

6. Yamamoto discloses a cooling mechanism for motors or generators. The structure disclosed has a hollow rotation shaft, through

which cooling oil is fed from the outside. The cooling oil flows through the motor through centrifugal force, where the taper of the inside of the shaft from one end to the other creates that centrifugal force. ([0008]; Fig. 1, elements 6, 7 and 10).

#### PRINCIPLES OF LAW

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros., Inc. v. Union Oil Co. of Calif.*, 814 F.2d 628, 631 (Fed. Cir. 1987). The Examiner bears the initial burden of presenting a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). If that burden is met, then the burden shifts to the Appellants to overcome the prima facie case with argument and/or evidence. *See Id.* The analysis need not seek out precise teachings directed to the specific subject matter of the claim but can take into account the inferences and the creative steps that a person of ordinary skill in the art would employ. *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007).

During examination, the claims must be interpreted as broadly as their terms reasonably allow. *In re Am. Acad. of Sci. Tech Center*, 367 F.3d 1359, 1369 (Fed. Cir. 2004). When the specification states the meaning that a term in the claim is intended to have, the claim is examined using that meaning, in order to achieve a complete exploration of the applicant's invention and its relation to the prior art. *In re Zletz*, 893 F.2d 319, 321-22 (Fed. Cir. 1989).

## ANALYSIS

Appellants argue that Kano cannot anticipate claims 1, 2 and 6 because Kano propels fluid through the shaft of the electric motor using a pump. (Br. 7). Appellants also assert that while Kano may draw air through inlet ports, this is not a nongaseous liquid and cannot be used to anticipate such elements of claims 1, 2 and 6. (*Id*). The Examiner finds that it is inherent that oil conducted through the passageways in Kano, because of their geometry, would be moved through action of centrifugal force generated by the rotation in the motor. (Ans. 10). We agree with the Examiner. Given the disclosure in Kano that air is forced through the motor by centrifugal force, (FF. 3), the same forces would also be supplied through the same rotation in the oil-cooled embodiments. We also note that there is nothing in claim 1, nor independent claims 9 and 17, that prohibit an outside pumping source from also being used. We do not find that the use of a pumping source and the centrifugal forcing of coolant through a motor to be mutually exclusive. Thus, Appellants have not persuaded us that the Examiner erred in rejecting claims 1, 2 and 6 over Kano.

With respect to claim 4, Appellants also “reject” the Official Notice taken regarding the use of a permanent magnet in an electric motor. (Br. 8). The Examiner finds support for such Notice in Yamamoto, where permanent magnets are used in place of an electromagnet. The Examiner finds this to be support for the common knowledge of their use in the art. (Ans. 10-11). We agree with the Examiner that the Official Notice taken was proper and can be relied upon in the rejection of claim 4. Thus, we affirm the rejection of claim 4.

With respect to the rejections of claims 3, 5, 9-12, 14, 17, and 18, Appellants assert that the disclosure of externally pumped coolants in Kano and Yamamoto prevents those references from teaching or suggesting all of the elements of those claims. (Br. 8). As discussed above, we are not persuaded by this argument. As such, we find no error in the rejections of claims 3, 5, 9-12, 14, 17 and 18.

With respect to the rejection of claims 7, 8, 15, and 16, Appellants argue that Grennan fails to teach or suggest all of the elements of those claims and that the combination of Grennan, Kato and/or Yamamoto would destroy the intent, function or purpose of the invention, because the vanes in Grennan do not have the capacity to pressurize oil. (Br. 8). We find that Grennan discloses the extra passageways recited in claims 7, 8, 15, and 16, (FF. 5), and that the combination would not defeat the purposes thereof. We find that one of ordinary skill in the art could have looked to Grennan, for its teachings of additional passageways, and incorporated those passageways into a motor taught by Kato and/or Yamamoto to construct a working motor. Given the teachings of Kato and Yamamoto, one of ordinary skill would have effectuated the extra passageways to accommodate the requirements of the motor disclosed by Kato and Yamamoto. As such, we find no error in the rejection of claims 7, 8, 15, and 16.

#### CONCLUSION OF LAW

We find that Appellants have not shown that the Examiner erred in rejecting claims 1, 2, and 6 under U.S.C. § 102 and claims 3-5, 7-12 and 14-18 under U.S.C. § 103 based on the cited prior art.



DECISION

The Examiner's rejections of claims 1-12 and 14-18 before us on appeal are affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

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